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Chromosome numbers of Polish brambles (*Rubus* L., *Rosaceae*). V.

Abstract

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The chromosome numbers in root-tip cells of *Rubus* species from Poland are reported. In *Rubus amygdalanthoides*, *R. chaerophylloides*, *R. chaerophyllus*, *R. fasciculatus*, *R. gothicus*, *R. gratus*, *R. hercynicus*, *R. hevellicus*, *R. koehleri*, *R. mollis*, *R. nemorosus*, *R. ostroviensis*, *R. pfuhlianus*, *R. posnaniensis*, *R. rudis*, *R. saxatilis*, *R. seebergensis*, *R. siemianicensis*, *R. spribillei* and *R. tabanimontanus* the tetraploid number of $2n = 28$ has been found, in *R. constrictus*, *R. crispomarginatus* and *R. divaricatus* the triploid number of $2n = 21$, and in *R. amygdalanthus* the pentaploid number of $2n = 35$. The diploid number $2n = 14$ has been published for *R. xanthocarpus*, a naturalized species of Chinese origin.

Additional key words: *Rubus*, karyology, chromosome number, Poland.

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INTRODUCTION

This is the next article of the series concerning the chromosome numbers of Polish brambles (Boratyńska 1994, 1995a, 1995b, 1996).

MATERIAL AND METHODS

The chromosome numbers have been counted in root-tip mitoses. The roots were fixed in Carnoy's solution, hydrolyzed in 1 N HCL, stained in aceto-carmin and squashed (Boratyńska 1994, 1995a).

RESULTS

R. amygdalanthus Focke (Sectio *Rubus*, series *Micantes* Sudre)
 $2n = 35$

This rare, local bramble is known only from its type locality. The pentaploid number of $2n = 5x = 35$ has been counted for the first time and only on material from one location.

Material studied: 1. Prov. Wałbrzych: Zwycięstwa Mountain, NNE of Strzegom, 8.08.1991. J. Zieliński.

R. amygdalanthoides Sprib. (Sectio *Rubus*, series *Micantes* Sudre)

$2n = 28$ (Fig. 1b)

This tetraploid species with $2n = 4x = 28$, a local taxon known only from a few localities in Silesia as karyologically studied for the first time.

Material studied: 1. Prov. Wałbrzych: 1 km SE of Dobroszów, 8.08.1991. J. Zieliński.

R. chaerophylloides Sprib. (Sectio *Rubus*, series *Micantes* Sudre)

$2n = 28$

This is a regional species endemic to Poland. The tetraploid number $2n = 4x = 28$ was found in two studied plants. It is the first information about chromosome number of the species.

Material studied: 1. Prov. Wrocław: between Bukowica and Lipnica, 25.08.1987, J. Zieliński; 2. Prov. Wrocław: between Laskowo and Korzeńsko, S of Rawicz, 28.07.1996, J. Zieliński.

R. chaerophyllus Sagorski & W. Schulze (Sectio *Rubus*, series *Micantes* Sudre)

$2n=28$

No chromosome numbers have been reported till now for this species. On two localities studied it appeared to be tetraploid.

Material studied: 1. Prov. Jelenia Góra: forest on NEE of Jurczyce on the road to Muchów, 19.07.1994, K. Boratyńska, A. Dolatowska, A. Tomlik-Wyremblewska, J. Zieliński; 2. Prov. Jelenia Góra: Wąwóz Myśluborski, SW of Myślubórz, 10.09.1992, A. Boratyński, K. Boratyńska, J. Zieliński.

R. constrictus P.J. Müll. & Lefèvre. (Sectio *Rubus*, subsectio *Rubus*)

$2n = 21$

The triploid number of $2n = 3x = 21$ counted in the sample investigated confirms earlier report of Gustafsson (1943).

Material studied: 1. Prov. Opole: Pokrzywnica, 2-3 km W of the village, 16.07.1988, J. Zieliński.

R. crispomarginatus Holub (Sectio *Rubus*, series *Discolores* (P. J. Müller) Focke)
 $2n = 21$

The number of chromosome has not been reported till now. Material from localities studied appears to be triploid with $2n = 3x = 21$.

Material studied: 1. Prov. Zamość: Tereszpol-Kukielki, 25.08.1993, A. Boratyński, K. Boratyńska, A. Dolatowska, P. Kosiński, J. Zieliński; 2. Prov. Kielce: SW of Kielce on the road to Staszów, 12.08.1987, J. Zieliński; 3. Prov. Wałbrzych: "Jarząbek", between Jugowice and Olszynec, 10.09.1987, J. Zieliński.

R. divaricatus P.J. Müll. (Sectio *Rubus*, subsectio *Rubus*)
Syn. *R. nitidus* Weihe et Nees
 $2n = 21$

The triploid chromosome number of $2n = 3x = 21$ for material from Sweden has been reported by Gustafsson (1943) and from Great Britain (England) by Datta (1932) and Heslop-Harrison (1953). Materials examined from southern Poland confirm these data.

Material studied: 1. Prov. Kalisz: Antonin, on the road to Grabów, 14.02.1993, J. Zieliński; 2. Prov. Wrocław: Borowina, 8 km S of Milicz, 6.08.1992, J. Zieliński; 3. Prov. Kalisz: Czarny Las, on the road to Ostrzeszów, 23.08.1994, J. Zieliński.

R. fasciculatus P.J. Müll. (Sectio *Corylifolii* Lindley, series *Subcanescentes* H. E. Weber)
 $2n = 28$ (Fig. 2a)

The hexaploid number of chromosome $2n = 6x = 42$ has been reported for this species by Gustafsson (1939) from Denmark. Another cytotype, tetraploid $2n = 28$, has been found in material cultivated in the Lund Botanical Garden as *R. ambifarius* P.J.Müll. (possibly synonym of *R. fasciculatus*), also by Gustafsson (1939). The same number of chromosomes has been found lately by Krahulcová and Holub (1997). My investigations also confirm the tetraploid number of chromosomes.

Material studied: 1. Prov. Zielona Góra: 1.5 km SW of Borów near Świebodzin, 22.07.1995, J. Zieliński; 2. Prov. Kalisz: Antonin on the road to Grabów, 14.07.1993, J. Zieliński.

R. gothicus Frid. & Gelert (Sectio *Corylifolii* Lindley, series *Subthyrsoidei* (Focke) Focke)
 $2n = 28$

Tetraploid numbers with $2n = 4x = 28$ have been reported for the species from Sweden and Denmark (Gustafsson 1939). On the island of Bornholm two different cytotypes of *R. gothicus* have been described, tetraploid and pentaploid (Gustafsson 1939). In all Polish samples this bramble was tetraploid with $2n = 4x = 28$.

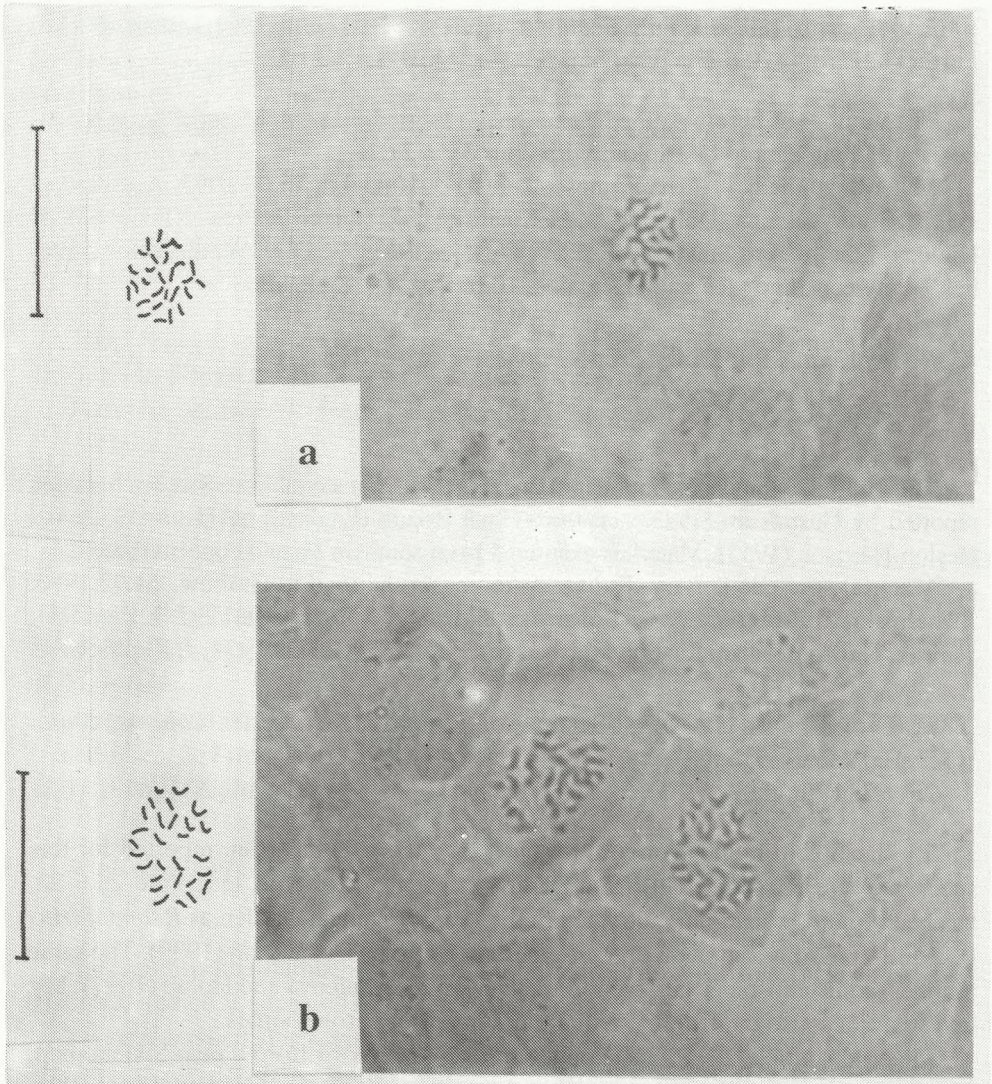


Fig. 1. Drawing and micrograph of metaphase in root-tip mitosis: a – *R. posnaniensis*, b – *R. amygdalanthoides*. Scale bar 10 μ m.

Material studied: 1. Prov. Koszalin: N of cross-road Ciechnowo-Jarząbek near Sławoborze, 3.07.1992, K. Boratyńska, A. Dolatowska, J. Zieliński; 2. Prov. Gorzów: Mostkowo, between Barlinek and Lipiany, 2.07.1992, K. Boratyńska, A. Dolatowska, J. Zieliński; 3. Prov. Szczecin: Łukęcin, 2.07.1992, K. Boratyńska, A. Dolatowska, J. Zieliński; 4. Prov. Gdańsk: Brzeżno Lęborskie near Kłębów, 4.07.1992, K. Boratyńska, A. Dolatowska, J. Zieliński.

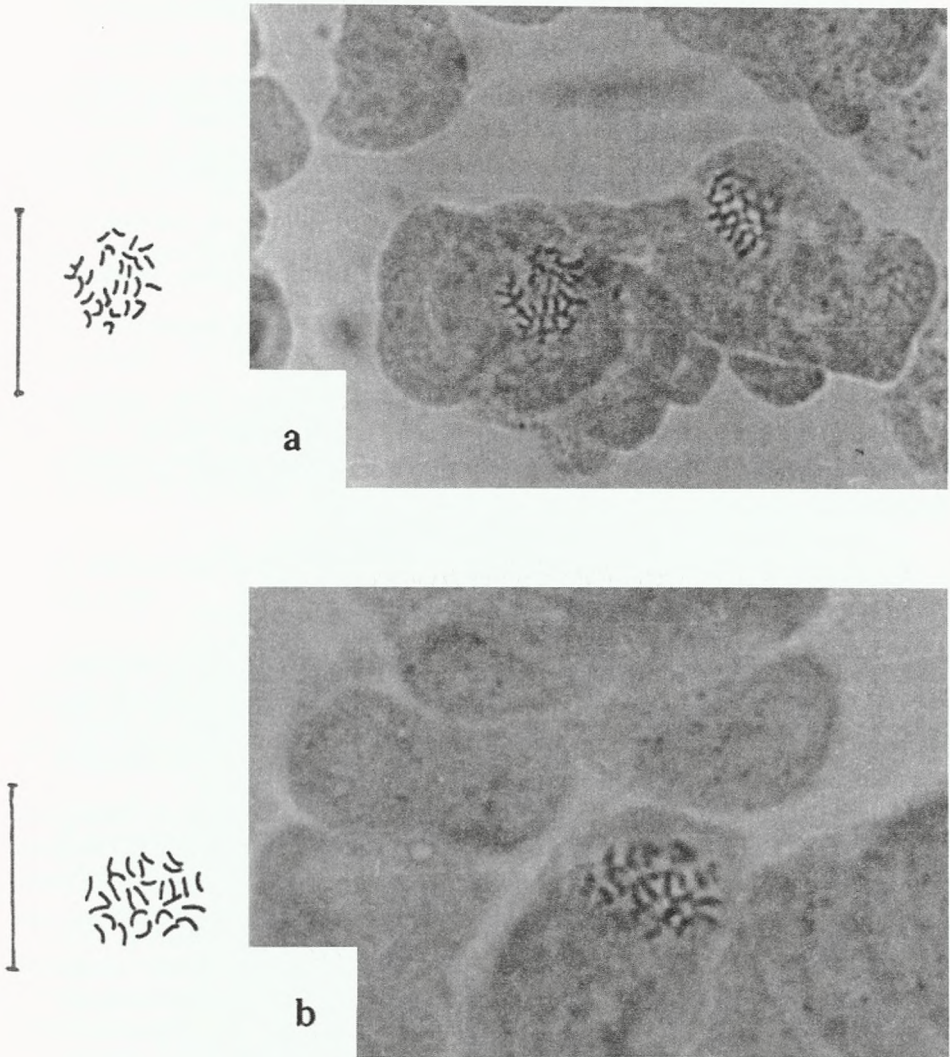


Fig. 2. Drawing and micrograph of metaphase in root-tip mitosis: a – *R. fasciculatus*, b – *R. tabanimumontanus*. Scale bar 10 μm.

R. gratus Focke (Sectio *Rubus*, series *Sylvatici* (P. J. Müller) Focke)

$2n = 28$

The tetraploid number $2n = 4x = 28$ found in both investigated samples, confirms the earlier reports by Gustafsson (1939, 1943).

Material studied: 1. Prov. Siedlce: 1 km S of Gończyc, 21.07.1990, J. Zieliński; 2. Prov. Siedlce: Kędzierak, 17.07.1990, J. Zieliński.

R. hercynicus G. Braun (Sectio *Rubus*, series *Glandulosi* (Wimmer et Grab.) Focke)
2n = 28

The chromosome number has not been counted till now. Two samples from Silesia appeared to be tetraploid with $2n = 4x = 28$.

Material studied: 1. Prov. Katowice: Obora, 24.08.1994, J. Zieliński; 2. Prov. Katowice: Brzezcie, SE of Rawicz, 25.08.1994, J. Zieliński.

R. hevellicus E.H.L. Krause (Sectio *Corylifolii* Lindley, series *Subthyrsoidei* (Focke) Focke)
2n = 28

This is a rare species karyologically not investigated till now. In the sample from studied locality a tetraploid karyotype with $2n = 4x = 28$ has been found.

Material studied: 1. Prov. Wrocław: S of Tworzymirki Dolne, 24.08.1995, J. Zieliński.

R. koehleri Weihe (Sectio *Rubus*, series *Hystrices* Focke)
2n = 28

The tetraploid $2n = 28$ (Heslop-Harrison 1953) and pentaploid $2n = 35$ (Marks 1952) numbers have been reported from Great Britain. Recently a tetraploid number has been found in the Czech Republic (Krauhlová and Holub – in print), and this was confirmed in my studies.

Material studied: 1. Prov. Jelenia Góra: Dynowice, on the road to Świerzawa, 18.07.1994, K. Boratyńska, A. Dolatowska, A. Tomlik-Wyremblewska, J. Zieliński; 2. Prov. Jelenia Góra: Góra Dłużycy between Dynowice and Świerzawa, 18.07.1994, K. Boratyńska, A. Dolatowska, A. Tomlik-Wyremblewska, J. Zieliński; 3. Prov. Tarnów: Szerzyny on the road to Maślaki, 18.08.1988, J. Zieliński.

R. mollis J. Presl & C. Presl (Sectio *Corylifolii* Lindley, series *Subcanescentes* H.E. Weber)
2n = 28

Information concerning the $2n=28$ chromosome number in this species has been reported by Krauhlová from the Czech Republic (Krauhlová and Holub, 1997). In my studies on the material from SW Poland it is also tetraploid with $2n = 4x = 28$.

Material studied: 1. Prov. Kłodzko: Łądek Zdrój, 15.07.1993, P. Kosiński.

R. nemorosus Hayne & Willd. (Sectio *Corylifolii* Lindley, series *Subsilvatici* (Focke) Focke)
2n = 28

First information concerning the tetraploid chromosome number of *R. nemorosus* has been given by Gustafsson (1933, 1939) and by Iwatsubo et al. (1995). In my examination this species was also tetraploid with $2n = 4x = 28$.

Material studied: 1. Prov. Legnica: Wilkołak Mountain, NW of Wilków, 18.07.1994, K. Boratyńska, A. Dolatowska, A. Tomlik-Wyremblewska, J. Zieliński; 2. Prov. Jelenia Góra: between Mikułowo and Sulików, 20.07.1994, K. Boratyńska, A. Dolatowska, A. Tomlik-Wyremblewska, J. Zieliński; 3. Prov. Zielona Góra: between Tuchola Żarska and Stara Wola, 25.08.1995, J. Zieliński.

R. ostroviensis Sprib. (Sectio *Rubus*, series *Glandulosi* (Wimmer et Grab.) Focke)
 $2n = 28$

This is an endemic Polish taxon not investigated karyologically till now.

Material studied: 1. Prov. Kalisz: 2.5 km SE of Zduny, on the road to Ostrowąs, 25.08.1995, J. Zieliński.

R. pfuhlianus Sprib. (Sectio *Rubus*, series *Pallidi* W.C. Watson)
 $2n = 28$

This species is endemic to Poland. It is the first information about the chromosome number for the species.

Material studied: 1. Prov. Poznań: Borówiec near Kórnik, 29.06.1992, K. Boratyńska, J. Zieliński.

R. posnaniensis Sprib. (Sectio *Rubus*, series *Glandulosi* (Wimmer et Grab.) Focke)
 $2n = 28$ (Fig. 1a)

This species is endemic to Poland not investigated karyologically yet. It is the tetraploid with $2n = 4x = 28$.

Material studied: 1. Prov. Kalisz: 1 km SE of Zduny, 25.08.1995, J. Zieliński.

R. rudis Weihe (Sectio *Rubus*, series *Radulae* (Focke) Focke)
 $2n = 28$

The tetraploid number $2n = 4x = 28$, counted in all my samples investigated from Poland, has been previously reported by Gustafsson (1939) from the Scandinavian Peninsula.

Material studied: 1. Prov. Siedlce: N of Mienia, 17.07.1990, J. Zieliński; 2. Prov. Siedlce: S of Jartypany, 18.07.1990, J. Zieliński; 3. Prov. Zamość: Florianka near Zwierzyniec, 24.08.1993, A. Boratyński, K. Boratyńska, A. Dolatowska, P. Kosiński, J. Zieliński; 4. Prov. Częstochowa: between Mokra and Miedźno, 14.07.1993, J. Zieliński.

R. saxatilis L. (Subgenus *Cyclatis* (Raf.) Focke)

2n = 28

The chromosome number of this species has been counted several times, in Schleswig-Holstein (Scheerer 1939), Finland (Vaarama 1939), England (Heslop-Harrison 1953) and Poland (Czapik 1978, 1981, 1983). In all studies, my investigations including *R. saxatilis* appeared to be tetraploid with $2n = 4x = 28$.

Material studied: 1. Prov. Poznań: S of Wiórki, 23.07.1993, K. Boratyńska, A. Dolatowska, J. Zieliński.

R. seebergensis Pfuhl. ex Sprib. (Sectio *Corylifolii* Lindley, series *Hystri-copses* H.E. Weber)

2n = 28

This species is endemic to Poland. The tetraploid number $2n = 4x = 28$ has been reported for the first time for this rare species.

Material studied: 1. Prov. Poznań: Zwierzyniec near Kórnik, 15.07.1991, J. Zieliński.

R. siemianicensis Sprib. (Sectio *Rubus*, series *Hystri-ces* Focke)

2n = 28

The tetraploid number $2n = 4x = 28$ has been found in all the investigated samples. This is a first report for this species endemic to Polish flora.

Material studied: 1. Prov. Kalisz: between Krotoszyn and Chachalnia, 25.08.1995, J. Zieliński; 2. Prov. Kalisz: Marianka Siemieńska, 3 km SW of Siemianice, 7.08.1995, J. Zieliński; 3. Prov. Katowice: Kielcza near Wielowieś, 24.08.1994, J. Zieliński.

R. spribillei (Pfuhl. ex Sprib.) Kulesza (Sectio *Corylifolii* Lindley, series *Hystri-copses* H.E. Weber)

2n = 28

This species is endemic to Poland. The tetraploid number $2n = 4x = 28$ has been found in all the samples investigated. These are the first kariological data for *R. spribillei*.

Material studied: 1. Prov. Kalisz: 2 km NNW of Laski (S of Kępno), 29.07.1992, J. Zieliński; 2. Prov. Poznań: Zwierzyniec near Kórnik, 29.06.1992, K. Boratyńska, J. Zieliński; 3. Prov. Poznań: Borówiec near Kórnik, 23.07.1993, J. Zieliński.

R. tabanimontanus Figert (Sectio *Rubus*, series *Micantes* Sudre)

2n = 28 (Fig. 2b)

The same tetraploid number $2n = 4x = 28$ has been found on material from the Czech Republic by Krahulcová (Krahulcová and Holub, 1997).

Material studied: 1. Prov. Legnica: Widoma Mountain, 8 km NW of Jawor, 9.09.1992, A. Boratyński, K. Boratyńska, J. Zieliński.

R. xanthocarpus Bureau & Franch. (Subgenus *Cyclatis* (Raf.) Focke)
 $2n = 14$

The species is of Chinese origin, found naturalized in Poland (Bróz and Zieliński 1993). The diploid number of $2n = 2x = 14$ reported by Gustafsson (1939), has been confirmed in the Polish material.

Material studied: 1. Prov. Kielce: Miedzianka, W of Kielce, 30.07.1992, B. Maciejczak, E. Bróz, J. Zieliński.

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Liczby chromosomowe jeżyn rosnących w Polsce. V

Streszczenie

Autorka podaje liczby chromosomowe dla 24 gatunków z rodzaju *Rubus* L. występujących w Polsce. Ponadto wspomina o jednym taksonie pochodzącym z Chin, naturalizowanym w naszym kraju. Większość przebadanych gatunków okazała się tetraploidami z $2n = 4x = 28$, trzy są triploidami z $2n = 3x = 21$, jeden pentaploidem z $2n = 5x = 35$ i jeden diploidem z $2n = 2x = 14$.